

# Total Organic Halogen Analyzer Model TOX-300

*Cost effective solution for environmental analysis  
Matrix independent combustion program without soot  
Improve lower measuring limit*

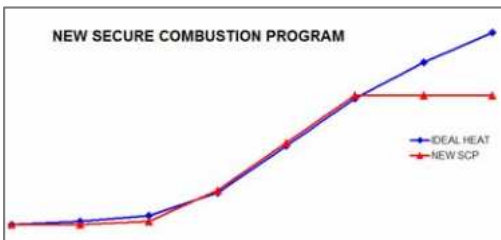


Advanced database software and the reputed coulometry methods allow measurement of chlorine and sulfur content in solid, liquid and gaseous samples down to the ppm level – to be fully utilized at various plants. (Conforms to ASTM D3120,3246,3961,5808,JIS K2541)

## Feature

### 1 Matrix Independent, unique single program for all samples.

Secure Combustion Program (SCP) enables ideal pyrolysis of substances in sample.



### 2 High-Speed Analysis Using the Boat Controller

Measurement is performed automatically in 6 to 12 minutes simply by placing a sample boat and starting measurement. Since the sample boat inlet box is provided with a cooling function (electronic cooling), the boat can be cooled in a short period of time for faster repetitive.



### 3 Application-Oriented System Configuration

The use of various options according to the particular sample make it possible to construct a system that precisely matches the application.

#### Basic Configuration

Electric furnace & Detector (horizontal type)  
Control unit (PC and printer)

#### Options (Injector, Sampler, Other)

Auto Boat Controller ABC-210

Liquid Sample Changer ABC-210 + ASC-250L

Solid Sample Changer ASC-240S

Gas Injector GI-210



Control unit (PC and printer)



Electric furnace & Detector unit TOX-300



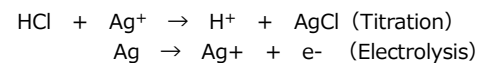
TOX-300 uses the same ABC and autosamplers as NSX-2100H. Customers can upgrade to high performance NSX-2100H by purchasing HF-210 and MCD-210.

## Measuring Principle

### Chlorine Analysis

#### Standard Set with Chlorine Titration Cell Unit

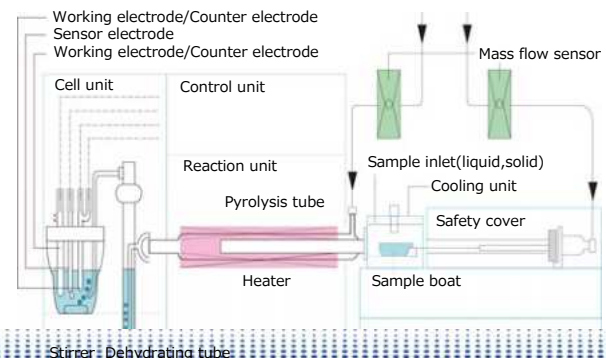
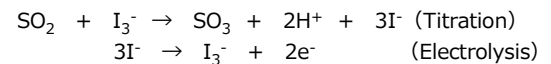
Samples are burned in an Argon/Oxygen atmosphere. The resulting chloride is lead into a titration cell where it is automatically titrated by silver ions generated coulometrically. The amount of chlorine is then calculated from the quantity of electricity required for the titration.



### Sulfur Analysis

#### Standard Set with Sulfur Titration Cell Unit

Samples are burned in an Argon/Oxygen atmosphere. The resulting sulfur dioxide is lead into a titration cell where it is automatically titrated by triiodide ions generated coulometrically. The amount of sulfur is then calculated from the quantity of electricity required for the titration.



Stirrer: Dehydrating tube

# Application

## Chlorine Analysis

Sample Name	Sample Size(mg)	No.of Measurements	Measured Value(ppm)	RSD(%)
Lubricating Oil	30	3	34	4
Kerosene	30μℓ	3	31	3
Crude Oil	30	3	4.0	3
Rubber	20	3	210	4
Carbon Fiber	20	3	193	3
Epoxy Resin	10	3	890	5
Polycarbonate Resin	30	3	7.9	3
Photoresist	30	3	7.2	2
Aluminum Foil	20	3	5.5	6
Waste Oil	10	3	390	3
Cement	10	3	460	3

## Sulfur Analysis

Sample Name	Sample Size(mg)	No.of Measurements	Measured Value(ppm)	RSD(%)
Lubricating Oil	3	3	0.76%	3
Heavy Oil	10	3	1.2%	3
Engine Oil	5	3	0.41%	4
Polypropylene	30	3	2.0	5
Surface Activator	5	3	883	0.5
Rubber	15	3	0.55%	1
Manganese Oxide	30	3	37	7
Zinc Oxide	30	3	14	0.7
Lanolin	30	3	39	5
Fish Oil	20	3	180	4
Soil	5	3	369	6

# Mode AOX

### Total Organic Halogen Measurement (AOX)

Easy, rapid and accurate Total Organic Halogen measurement in environmental and industrial waste water by Mitsubishi adsorption and coulometry technique based on ISO9562, EPA9020 etc.

#### Measuring principle

##### 1. Adsorption and washing

For adsorbing AOX, flow sample water, 10 – 200ml, through activated carbon with constant rate. After adsorption, wash the carbon by nitrate solution for eliminating inorganic halogens.

##### 2. Combustion

The activated carbon on a sample boat is inserted into a heater furnace by Auto Boat Controller (ABC). AOX is converted to hydrogen halide by oxidative combustion.

##### 3. Titration

Hydrogen halide is introduced into a titration cell for silver titration. Halogen content is calculated by electrical quantities based on Faraday's law.

### Adsorption module TXA-04

Optional unit for automatic AOX adsorption and inorganic halogen washing.



Syringe	Disposable syringe 20ml
Flow method	Automatic syringe system
Maximum Flow Volume	
Syringe for flowing samples:	300ml (10 × n ml (n=1 to 30))
Syringe for washing:	50ml (5 × n ml (n=1 to 10))
Syringe quantity	5 pcs (for flowing samples or washing inorganic halide)
Column	3mm φ × 40mm, two-stage glass column
Power	AC 100V to 240V, 50/60Hz, 50VA
Dimensions / Weight	Approx. 480(W) × 270(D) × 530(H) mm / 13 kg

# Option



MODEL	ASC-240S Solid Sample Changer
Sample	Solid, Liquid (manual)
Amount of sample	Solid 150mg Liquid 100μl
Boat, number of sample	Ceramic, 40 pos.
Sample injection	Auto boat control
Boat cooling	Peltier
Power	AC 100V to 240V, 50/60Hz, 80VA
Dimensions / Weight	480(W) × 460(D) × 520(H) mm / 31 kg



MODEL	ABC-210 Auto Boat Controller
Sample	Solid, Liquid
Amount of sample	Solid 150mg Liquid 100μl
Boat	Quartz, disposable ceramic
Boat cooling	Peltier
Power	AC 100V to 240V, 50/60Hz, 40VA
Dimensions / Weight	445(W) × 250(D) × 180(H) mm / 9 kg



MODEL	ASC-250L Liquid sample changer
Sample	Liquid (non-aqueous, aqueous)
Injection	Max 150μl (depend on sample)
Injection speed	0.4 - 50μl/sec (depend on sample)
Number	50pos in each 2, 4, 6ml vial tray
Power	AC 100V to 240V, 50/60Hz, 180VA
Dimensions / Weight	460(W) × 320(D) × 470(H) mm / 16 kg



MODEL	GI-210 Gas injector
Sample	Non-pressurized gas, Volatile liquid
Injection	10μl for liquid, 10ml for gas
Carrier	Argon
Heat	80°C for liquid
Power	AC 100V to 240V, 50/60Hz, 20VA
Dimensions / Weight	220(W) × 200(D) × 110(H) mm / 4 kg

## STANDARD SPECIFICATION

Models	Chlorine and Sulfur Analyzer/Total Organic Halogen Analyzer Model TOX-300
Analysis methods	Oxidation decomposition / Coulometric titration
Oxidation decomposition	Quartz tube combustion method
Samples	Liquids, solids and gaseous (Use the gas injector Model GI-210.) samples
Sample Insertion	Automatic insertion by the sample boat (Use ABC unit.)
Pyrolytic furnace	Horizontal furnace: Up to 1100 degrees Celsius
Detection method	Oxidation-reduction potential (potentiometric detection by potential)
Detection electrode	Chlorine measurement: Silver electrode Sulfur measurement: Platinum electrode
Titration control	Automatic control of electrolytic current
Measurement range	Refer to Table Measurement Ranges".

### Measurement Ranges

Absolute volume	Solid samples	Liquid samples	Gas samples
Chlorine: 0.05µg/ml to 50µg	2µg/g (30mg)	0.5µg/ml (100µl)	5mg/m <sup>3</sup> (10ml)
Sulfur: 0.05µg/ml to 50µg	2µg/g (30mg)	0.5µg/ml (100µl)	5mg/m <sup>3</sup> (10ml)

(Usual samples: Samples which are combustible under 1100 degrees Celsius and have no interference.)

Sample volume	Liquid sample: 100µl or less, Solid sample: 30mg or less
Measurement Time	Within 10 minutes/ One measurement (At 2µg measurement)
Temperature and humidity	15 to 35 degrees Celsius, 80%RH or less (No condensation)
Dimensions	TOX-300 main unit: 550(W) × 360 (D) × 437 (H) mm ABC-210 unit: 440(W) × 250(D) × 180(H) mm
Weight	TOX-300 main unit: 36kg ABC-210 unit: 11kg
Computer	Windows® English version pre-install
Printer	Windows®-compatible printer
Gas	Oxygen (purity : 99.7 % or more) Argon (purity : 99.98 % or more)
Power	TOX-300 main unit: AC100/115/230/240V, 50/60Hz, 980VA ABC-210 unit: AC100/115/230/240V, 50/60Hz, 40VA



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